

it seems to us to be peculiarly successful, as we would expect from one writing out of full knowledge and with strong enthusiasm, and what he has to say may be profitably read by many besides the laity. Besides descriptions of the various constituents of the plankton—crustaceans, rotifers, infusorians, algæ, and so on—Dr. Zacharias gives an account of methods of study, of the relations of the plankton to environmental conditions, of the origin of new species and varieties by isolation, of the inter-relations of plants and animals, of the application of hydrobiology to fisheries, and of the pioneer station at Plön.

(3) Prof. K. Giesenhagen deals with a subject more difficult than those of the two preceding volumes—namely, fertilisation and heredity in the vegetable kingdom. He begins with the phenomena in their simplest terms in the green algæ, and works gradually upwards through moss and fern to phanerogams, not forgetting the by-paths of parthenogenesis and vegetative multiplication. The point about his treatment is that he uses the facts as a basis for a discussion of the deep problems of heredity, such as those raised and in part solved by the discoveries of Mendel and his successors.

(4) Prof. Paul Gisevius has compressed into a small volume what every educated person should know about plants, and there is a flavour of intellectual "pémican" in the result. He deals first with the structure of plants, both inside and outside; he then discusses nutrition and respiration, constructive metabolism, and the migration of material; he leads us from seed and seedling to the flowering, fruiting and withering; he takes a survey of the vegetable kingdom, and throws the light of the past on the present; and he ends up with the phenomena of reproduction and with breeding experiments. It seems to us that he attempts too much, carrying terseness to an extreme, but his work is well done.

(5) Prof. Ludwig von Graff supplies a masterly introduction to the study of parasitism among animals. Without overwhelming us with details, he takes us into the heart of the subject, and the style of the book is a model. Von Graff has much that is extremely interesting to relate—for parasitology has made great advances of recent years—and his discussion of such themes as the origin of the parasitic habit and the influence of parasitism on the parasite is very instructive. Admirable too are the tabular summaries of life-histories. The appalling list of human parasites, based on Braun's well-known treatise, reaches a total of 129, and this number must be greatly increased, since in not a few cases several species are counted as one.

(6) In some ways the most striking volume in this bundle of primers is that in which Prof. Max Verworn deals with "the mechanism of psychical life." It consists of five lectures on the physiological aspects of mental processes, and the author has been well advised to leave them with the vividness of oral discourse. He deals with the relations of mind and body (the dualism of which he regards as a superannuated fiction), with the processes, e.g. fatigue-changes, in the nervous elements, with the dissimulatory stimuli that

pass incessantly through the intricate maze of nerve-fibres and ganglion-cells, with the fascinating phenomena of sleep and dreaming, and with the puzzles of suggestion and hypnosis. More, perhaps, than in regard to the other little books which we have noticed is there room here for difference of opinion, but all will agree that the author presents his view of psychical life with masterly clearness. It must be clearly noted that he refrains from giving his facts any philosophical setting, he argues neither for materialistic nor for spiritualistic interpretation, he aims at a physiological analysis of the sequences with which we are all familiar, and he does not conceal that his title expresses a scientific ideal rather than an actual achievement.

J. A. T.

OUR BOOK SHELF.

Index of Archaeological Papers (1665–1890). Edited by G. L. Gomme. Pp. xi+910. (London: A. Constable and Co., Ltd., 1907.) Price 25s. net.

THIS volume is in effect an author-index to the papers of archaeological and kindred character published in the journals of learned societies and elsewhere during the twenty-five years prior to 1891. It includes the contents of some ninety-four periodicals, amounting in all to nearly 20,000 monographs under the authors' names. An appendix supplies a list of the titles which were found to have been omitted from the main classification during its compilation.

The papers of like characters which have appeared from 1891 until the last year or so have already been similarly treated in the annual index, published under the auspices of the Congress of Archaeological Societies in union with the Society of Antiquaries. There is thus placed before the student of to-day, as the editor justly claims, a continuous index from the first publications in the *Philosophical Transactions* of the Royal Society down to the present time. This work is henceforth as indispensable to the student of British archaeology, in particular, as are the tables of logarithms, sines, and cosines to the mathematician. The latter may be calculated, indeed, just as the archaeological papers may be hunted out by individual workers; but those who in the past have wasted hours and days in turning over the pages of twenty-five times ninety-four volumes in search of their own quest will be grateful to Mr. Gomme and his helpers for their patient work, and for the completeness of the result.

This index includes within its scope, not only the archaeology of the British Isles, but archaeological fragments from many countries. Thus we find Evans (A. J.) on Albania, Birch, Budge, Petrie, Poole (R. S.), and Renouf on the problems of Egypt, Hogarth on inscriptions from Salonica, Ramsay on the results of his explorations in Phrygia and western Asia Minor, and so forth. The difficulty of editing such a mass of different material must have been very great, and the work laborious. Here and there we notice the inclusion, whether accidental or intentional, of papers which seem to us to be irrelevant; as, for example, "The Writings and Influence of Coleridge" (Redish), "The Height and Weight of Boys aged Fourteen in Town and Country Schools," and other more or less statistical writings, by Francis Galton. In other cases where folklore is the subject, discrimination is less easy; and we certainly think that the editor has been wise to incorporate writings of philological character in cases where the author's material was archaeological. Thus M. Maspero on various

features of Egyptian archæology and philology, and Sir J. Rhys covering similar ground in Wales, are not inappropriate.

There is one thing, however, which we commend earnestly to the Congress, namely, the preparation and publication of a supplementary place-index, which might be brought as nearly to date as possible, and would render this volume and the annual indexes doubly or trebly valuable. The fact that some fifty-four of the journals indexed are the publications of local archæological societies speaks for itself. With Mr. Gomme's work completed the rest would be easy; but it is none the less an urgent need.

Notions générales de Biologie et de Plasmogénie comparées. By Prof. A. L. Herrera. Translated by G. Renaudet. Pp. xxviii+260. (Berlin: W. Junk, 1906.) Price 10 marks.

This is a remarkable book, full of suggestive speculation, much of which is unlikely to command general acceptance, but at the same time the analogies which the author draws between emulsions of various sorts and organic form are full of interest.

The whole book seems to have arisen out of a series of notes for students, and its rather disconnected form retains the impress of this original design. The result is rather original, and arrests the attention even where one does not agree with the author.

Prof. Herrera suggests that organic structure arises as the result of precipitation, coagulation, or solidification modified by the presence of diffusion currents and similar influences. A large number of experiments are given in which commonly occurring organic structure is closely imitated by precipitations of silica, &c., under conditions which are carefully described.

There is a refreshing freedom from dogmatism, but the author has the full courage of his own convictions, as is shown by the crisp and clear definitions which he gives of phases of organic life that most investigators find difficult of satisfactory expression.

The work is introduced by a preface from the pen of Moritz Benedikt, professor of medicine at Vienna, who is, of course, in sympathy with the general trend of the book, whilst he is, like its author, alive to the many difficulties in establishing all the conclusions. A sentence from the final essay of the volume, also contributed by Prof. Benedikt, puts the main thesis of Herrera so clearly that we may be pardoned for quoting it:—"... le monde organique, et la vie, sont nées du monde minérale dans les masses de vésicules mousseuses hautement organisées."

Einführung in die Paläontologie. By Gustav Steinmann. Second edition. Pp. xii+542; illustrated. (Leipzig: W. Engelmann, 1907.) Price 14 marks.

IN the matter of bulk this edition shows a marked increase over the first edition (1903); while, in most cases, at any rate, it appears to have been brought fairly well up to date. The ancestral proboscideans from the Egyptian Eocene are, for instance, duly noticed, and recent work on Patagonian Tertiary vertebrates likewise receives due attention. On the other hand, we notice an absence of any reference to Dr. Broom's opinion that the South African Triassic *Tritylodon* is, after all, a mammal; while in certain cases the author departs from the generally accepted classification without any apparent or sufficient reason. In the ungulate mammals, for example, the hippopotamus is removed from the *Artiodactyla* to find a place with *Dinoceras* and *Coryphodon* among the *Amblypoda*; in fact, *Hippopotamus* and the American Tertiary genus *Merycochoerus* are actually included in the family *Coryphodontidae*. This is bad enough, but when we find *Oreodon*—the immediate ally of *Mery-*

cochoerus—occupying its proper position in the neighbourhood of the camels, we are at a loss whether to attribute such eccentricities to mere carelessness or to lack of knowledge on the part of the author.

Carelessness cannot, however, be pleaded in the case of the phylogeny of the vertebrata given at the close of the volume. For there we have carefully compiled tables in which the dolphins are brigaded with ichthyosaurs as *Ichthyotheria*, while sperm-whales and plesiosaurs are grouped together as *Plesiotheria*, and whalebone whales and the mosasaurs as *Thalattotheria*. The giving of definite names to these incongruous groups is of itself a sufficient proof that the author regards them as definite phylogenetic assemblies, and not mere instances of adaptive analogy; but the matter is clinched by the following statement on p. 512, viz.:—"Wir sind also vor die Entscheidung gestellt, entweder ein unverständliches und geradezu übernatürliches Eingreifen vorauszusetzen, oder uns im Rahmen des gesetzmässigen Naturgeschehens die zahlreichen einzelnen Säugerstämme voneinander gesondert aus ebensoviele Stämmen der Reptilien herworgegangen zu denken."

With such eccentricities, alike in classification and phylogeny, we are unable to recommend Dr. Steinmann's volume as a trustworthy guide to the student of palæontology. Neither can we congratulate the publishers on the illustrations, unless, indeed, a "palæographic" style of art be deemed specially suitable to a palæontological treatise.

R. L.

The Chemistry of the Diazo-compounds. By Dr. J. C. Cain. Pp. xi+172. (London: Edward Arnold, 1908.) Price 10s. 6d. net.

WHEN we compare the steady output of monographs on chemical subjects on the Continent with the few publications of this class in English, we naturally ask whether English publishers are less enterprising than their neighbours, or English chemists less given to specialisation.

We are inclined to the former view, and regard it as a welcome sign that the new departure in English chemical literature, introduced in the form of physical chemistry manuals, and published under the editorship of Sir W. Ramsay, has found favour with another enterprising firm, and extended to organic chemistry. It is to be hoped that the present volume represents the first of a series of similar publications.

Although the chemistry of the diazo-compounds appears at first sight to be a subject of rather restricted range, it must not be forgotten that it is of direct technical importance, connected as it is with one of the largest branches of the colour industry. Moreover, a special interest attaches to the appearance of Dr. Cain's book at the present time, for it stands as a memorial of the fiftieth anniversary of Griess's famous discovery. Although Johann Peter Griess was a German, born and bred, the bulk of his researches on the diazo-compounds were carried on in this country, first whilst he was acting as assistant to Hofmann in London, and later during intervals of leisure extending over many years after his appointment as chemist to Messrs. Allsopp, brewers, of Burton-on-Trent.

The protean character of the chemical changes which the diazo-compounds exhibit, their close connection with colour chemistry, as well as their structural relations, which still furnish a perennial subject of discussion, appeal in turn to the scientific and industrial chemist (if this distinction between the two forms of chemical energy is permissible). The author has been able to write with the authority of long experience in the works and in the laboratory, and his exhaustive method of treatment has not rendered